PROCEDURE **Department of Natural Resources**

Date: May, 2000

Cancels: **This procedure replaces PR 14-006-050, issued August 1999. Implement immediately.**

PR 14-006-050 PRE-COMMERCIAL THINNING

APPLICATION All forested ecosystems on trust lands.

DISCUSSION

This procedure is used to assess the need to reduce the number of trees within a stand. Reducing the number of trees (conducting a pre-commercial thinning (PCT)) can accelerate the development of a later stage of forest ecosystem succession. Conducting PCT in some stands of trees at an early age (i.e., 12 to 20 years) promotes more desirable stand characteristics for the future stand and helps the department achieve its economic and ecosystem management goals. Reasons for pre-commercial thinning vary. Indicators may be based on site-specific circumstances, or some PCT thinning may be necessary and/or desirable in order to:

- provide a desirable habitat condition now or in the future,
- reduce the risk of significant growth loss,
- produce a positive economic return (present net worth) to the trust beneficiaries,
- reduce the risk of disease and/or insect damage, or
- ensure adequate stocking with conifers.

The results of this procedure, in part, help to determine if thinning may be delayed until a commercial harvest operation is feasible (and therefore produce a financial return to the trust). Commercial harvests should have an appraisal value of at least $10 per ton and remove a minimum volume of three mbf per acre.

Action

1. Identify stands that appear to need stocking control (i.e., those that will suffer significant growth loss before developing to a commercial thinning stage or regeneration harvest stage). Significant growth loss is determined by the upper limit of the desirable relative density (RD) range or when the percentage of live crown ratio is below 50 in young stands. Refer to thinning guideline PR 14-006-070 for more information.

    a. Request stand-level data from the Forest Resource Inventory System (FRIS), if it is current and available. If FRIS is not useable, follow the FRIS Field Procedures Handbook and survey stands that may need to be pre-commercial thinned. If the first few plots indicate that the stocking level is greater than the levels listed in Step (1)(b), discontinue the survey.

    b. Schedule PCT for overstocked stands that represent a risk of significant growth loss. These stands may need PCT as early as 12 years of age. Stands that are considered to be overstocked are:

- west-side stands with at least 500 trees per acre,
- east-side stands with at least 450 trees per acre,
- any stand with the live crown ratios below 50 percent, and
- those stands managed specifically for habitat under the Habitat Conservation Plan that have 300 trees or more per acre (i.e., those that are managed for riparian, nesting, roosting and foraging, or dispersal habitat).

c. Analyze the potential financial benefits of conducting PCT.

   i. Conduct an economic analysis using DNR's Intensive Management Program simulator (DNRIMPS) for west-side planning units or Forest Vegetation Simulator (FVS) for east-side planning units.

   ii. Include a "no-treatment" and at least two treatment analyses that assume a range of realistic treatment specifications including the proposed treatment specification.

d. Evaluate the risk of stand failure due to disease and/or insect damage.

   i. Favor species that have a lower susceptibility to insect or disease problems that are known or expected to exist on a particular site over more susceptible species.

   ii. Evaluate stands to determine areas impacted by insect and/or disease problems and the severity of the problem. Contact staff specialists in entomology or pathology when necessary.

2. Determine the appropriate time to conduct a pre-commercial thinning.

   a. Physical characteristics such as live crown ratio (the portion of the tree in live (green) crown compared to total tree height) can be used to determine when a stand is ready for pre-commercial thinning. A general guideline is that PCT may be delayed for stands with a live crown ratio greater than 50 percent. However, the live crown ratio should not be allowed to fall below 40 percent.

   b. Do not conduct PCT prior to full occupancy (i.e., when the crowns of trees are touching) of the site by existing trees. This should allow large trees to be removed efficiently and not severely impact the growth of neighboring trees.

   c. Update the PCT schedule in the Planning and Tracking (P&T) system and adjust each silvicultural prescription if a stand is not ready for PCT.

3. Develop the desired post-thinning stand conditions that will meet the forest management unit (FMU) objective(s) (see PR 14-005-010).

   a. Leave species in the residual stand that contribute the most to meeting the FMU objectives. Try to match a desired species' growth requirements to the site conditions.

   b. Leave, where possible, compatible species in even-aged managed stands to provide a range of products for future harvests (e.g., consider leaving 50 stems per acre of

western red cedar in excess of normal stocking). Shade tolerant trees can survive as intermediate trees among crowns in a Douglas-fir stand with little impact on the Douglas-fir and have the potential to produce merchantable poles.

c. A single, desirable stocking target does not exist for a pre-commercial thinning. Varying residual stocking will only impact the length of time required for a stand to develop to a self-thinning stage. Leaving more trees will shorten the time period and leaving fewer trees will lengthen the time period required to reach the self-thinning stage.

   i. Consider the following factors when determining the residual stand's stocking level:

      - the span of time until the next stand entry,
      - the anticipated growth rate,
      - the time required for the residual stand to start self-thinning,
      - habitat Conservation Plan habitat requirements, and
      - Lynx Habitat Management Plan for DNR Managed Lands habitat requirements.

   ii. Determine target stocking levels for residual stands that will not be managed to provide habitat as a primary objective:

      - Leave between 250 and 300 stems per acre after a pre-commercial thinning in a severely overstocked stands. This range is based upon the assumption that the next entry into the stand will be a commercial harvest, most likely a commercial thinning. Use DMRIMPS or FVS to select the correct timing and diameter size for the commercial thinning that is planned in the future.

      - Leave 200 stems per acre or less where commercial thinning will not happen due to access problems and on low quality sites (site IV, provided no more than 60 percent of the total stems are removed, or lower) where no commercial thinning is anticipated. Use DNRIMPS or FVS to set the anticipated stocking levels for the FMU at the time of harvest. Use the relative density rates set in PR 14-005-020.

   iii. Determine the target stocking level for residual stands that will be managed to provide habitat as the primary objective. (i.e., riparian management zones, nesting, roosting, and foraging areas. etc.) as follows:

      - Run DNRIMPS or FVS models to determine the required spacing to reach a relative density of 50 at the next entry.
      - Maintain stand diversity by favoring minority species.
      - Maintain a hardwood component of 15 percent of the stand if hardwood is present.

d. Leave a mix of species, where possible, to reduce the risk of loss from catastrophic insect and/or disease infestation. Leave at least one big leaf maple, if available, for

habitat.

4. Prioritize stands for PCT then conduct the activity. Regions will prioritize stands in the following descending order; those stands that are:

   a. severely overstocked,

   b. managed under the Habitat Conservation Plan or the Lynx Habitat Management Plan for DNR Managed Lands for habitat requirements,

   c. expected to provide the greatest economic return, then

   d. currently undergoing self-thinning (i.e., those stands with a high relative density).

5. Update scheduled pre-commercial thinning in the P&T system.

6. Monitor and report in the P&T system. Schedule and confirm an initial FRIS survey.

APPROVED BY: signed, May 2000
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SEE ALSO:

	FINAL HABITAT CONSERVATION PLAN, SEPTEMBER1997
	LYNX HABITAT MANAGEMENT PLAN FOR DNR MANAGED LANDS, NOVEMBER 14, 1996
PO14-034	FERTILIZING, THINNING AND PRUNING
PR 14-005-010	DEVELOPING FOREST MANAGEMENT UNIT OBJECTIVES
PR 14-005-020	IDENTIFYING AND PRIORITIZING STANDS IDENTIFIED FOR REGENERATION HARVEST
PR 14-006-070	WEST-SIDE SMALLWOOD THINNING PROCEDURES

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